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| 09/824,898 | 04/02/2001 | Eric B. Kushnick | CRED 2164 | 2197 |
| 7812 | 7590 | 06/22/2006 | EXAMINER | |
| SMITH-HILL AND BEDELL, P.C. | | | CHEN, TSE W | |
| 16100 NW CORNELL ROAD, SUITE 220 | | | ART UNIT | |
| BEAVERTON, OR 97006 | | | PAPER NUMBER | |
| | | | 2116 | |

DATE MAILED: 06/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/824,898

Applicant(s)

KUSHNICK, ERIC B.

Examiner

Tse Chen

Art Unit

2116

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 17-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 17-19 is/are allowed.
- 6) ☒ Claim(s) 1-8, 11, 20-27, 30, 34 and 35 is/are rejected.
- 7) ☒ Claim(s) 9, 10, 12-14, 28, 29, 31-33 and 36-38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

In view of the appeal brief filed on May 22, 2006, PROSECUTION IS HEREBY REOPENED. New ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31. A new notice of appeal fee and appeal brief fee will not be required for applicant to appeal from the new Office action. Any appeal brief filed on or after September 13, 2004 must comply with 37 CFR 41.37.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-8, 11, 20-21, 23-27, 30, 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hondeghem, US Patent 4255790, in view of Christiansen et al., "TTCrx Reference Manual", hereinafter Christiansen.

3. In re claim 1, Hondeghem discloses an apparatus [fig. 1] for generating pulses of a third pulse sequence [A1-E1] in response to pulses of a periodic first pulse sequence [76] having a period T_p [abstract], the apparatus comprising:

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- A programmable sequencer [CPU 70, RAM 84, I/O logic 112 with other associated circuitries] for changing a magnitude of the first control data [116] and a magnitude of the second control data [118] in response to each pulse of the first pulse sequence [76] such that the magnitudes of the first and second control data vary repetitively in a programmably adjustable manner [fig.2-3; col.4, 1.62 – col.5, 1.57; col.6, 11.20-57; program X# of times for desired repetition].
4. Hondeghem did not discuss details of generating the pulse sequences as related to resolution.
5. Christiansen discloses an apparatus [programmable fine deskew; fig.10] for generating pulses of a third pulse sequence [out] in response to pulses of a periodic first pulse sequence [in] having a period T_p [T], wherein timing of each pulse of the third pulse sequence is adjustable with a resolution [Δt] that is smaller than period T_p [Appendix A; TTCrx Architecture], the apparatus comprising:
- First means [first DLL] for generating each pulse of a second pulse [output from mux of first DLL] sequence in response to a separate pulse of the first pulse sequence with a first delay adjustable by first control data [sel] with a resolution of T_p/N [Δt_n] over a first range [T] substantially wider than T_p/M [Δt_{n-1}], wherein M [$N-1$] and N are differing integers greater than one [fig.10].
 - Second means [second DLL] for generating each pulse of the third pulse sequence in response to a separate pulse of the second pulse sequence with a delay adjustable by a second control data [sel] with a resolution of T_p/M [Δt_{n-1}] over a second range [T] substantially wider than T_p/N [Δt_n].

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- A programmable sequencer [control and data interface] for changing a magnitude of the first control data and a magnitude of the second control data in response to each pulse of the first pulse sequence [fig.4].

6. It would have been obvious to one of ordinary skill in the art, having the teachings of Christiansen and Hondegghem before him at the time the invention was made, to modify the apparatus taught by Christiansen to include the teachings of Hondegghem, in order to obtain the apparatus comprising the various means for generating the associated pulse sequence with a desired resolution. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to provide high-resolution [picoseconds] pulse sequences [Christiansen: Appendix A; higher resolution capability lends to the desirable more accurate pulse sequence generation for apparatuses such as Hondegghem].

7. As to claims 2 and 5, Christiansen discloses, wherein M [e.g., 4] and N [e.g., 5] are relatively prime [Appendix A].

8. As to claim 4, Christiansen discloses, wherein the first range is at least as wide as $(1 - 1/N)T_p$ and the second range is at least as wide as $(1 - 1/M)T_p$ [Appendix A; both DLLs cover T].

9. As to claim 6, Christiansen discloses, wherein the third pulse sequence is periodic [TTCrx Architecture; output periodic clock synchronous to the system clock is produced].

10. As to claim 7, Christiansen discloses, wherein the first means comprises a plurality of first gates connected in series for generating pulses of the second pulse sequence in response to pulses of the first pulse sequence, wherein each first gate has a switching delay of T_p/N [T/N] [Appendix A].

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11. As to claim 8, Christiansen discloses, wherein the second means comprises a plurality of second gates connected in series for generating pulses of the third pulse sequence in response to pulses of the second pulse sequence, wherein each second gate has a switching delay of T_p/M $[T/N-1]$ [Appendix A].

12. As to claim 11, Christiansen discloses, wherein the first means comprises a plurality of first gates connected in series for generating pulses of the second pulse sequence in response to pulses of the first pulse sequence, wherein the second means comprises a plurality of second gates connected in series for generating pulses of the third pulse sequence in response to pulses of the second pulse sequence, wherein each first gate has a switching delay of T_p/N $[T/N]$, and wherein each second gate has a switching delay of T_p/M $[T/N-1]$ [Appendix A].

13. In re claim 20, Christiansen and Hondeghem disclose each and every limitation of the claim as discussed above in reference to claim 1. Christiansen and Hondeghem disclose the apparatus; therefore, Christiansen and Hondeghem disclose the method of operating the apparatus.

14. As to claims 21 and 24, Christiansen and Hondeghem disclose each and every limitation of the claim as discussed above in reference to claims 2 and 20.

15. As to claim 23, Christiansen discloses, wherein the first and second ranges are each at least as wide as T_p [Appendix A; both DLLs cover T].

16. As to claim 25, Christiansen discloses each and every limitation of the claim as discussed above in reference to claims 6 and 20.

17. As to claim 26, Christiansen discloses each and every limitation of the claim as discussed above in reference to claims 7 and 20.

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18. As to claim 27, Christiansen discloses each and every limitation of the claim as discussed above in reference to claims 8 and 20.

19. As to claim 30, Christiansen discloses each and every limitation of the claim as discussed above in reference to claims 11 and 20.

20. In re claim 34, Christiansen and Hondegheem disclose each and every limitation as discussed above in reference to claim 1. Christiansen discloses a method for generating pulses of a third pulse [out] sequence in response to pulses of a periodic first pulse sequence [in] having a period T_p [T], wherein timing of each pulse of the third pulse sequence is adjustable with a resolution [Δt] that is smaller than T_p [Appendix A; TTCrx Architecture], the method comprising the steps of:

a. Generating each pulse of a second pulse sequence [output from mux of first DLL] in response to a separate pulse of the first pulse sequence with a delay adjustable by a first control data [sel] with a resolution of T_p/N [T/N],

b. Generating each pulse of the third pulse sequence in response to a separate pulse of the second pulse sequence with a delay adjustable by a second control data [sel] with a resolution of T_p/M [T/N-1],

c. Changing a magnitude of the first control data and a magnitude of the second control data in response to each pulse of the first pulse sequence wherein M [N-1] and N are relatively prime integers greater than one [fig.10].

21. As to claim 35, Christiansen discloses, wherein step a comprises applying the first pulse sequence as input to a plurality of first gates connected in series so that the first gates generate pulses of the second pulse sequence, wherein step b comprises applying the second pulse

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sequence as input to a plurality of second gates connected in series so that the second gates generate pulses of the third pulse sequence, wherein each first gate has a switching delay of T_p/N [T/N], and wherein each second gate has a switching delay of T_p/M [T/N-1] [Appendix A].

22. Claims 3 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christiansen and Hondegheem as applied to claim 1 above, and further in view of Heyne, US Patent 6194928.

23. Christiansen and Hondegheem discloses each and every limitation as discussed above in reference to claim 1. Christiansen and Hondegheem did not disclose that at least one of the first and second ranges is wider than T_p .

24. Heyne discloses an apparatus [fig. 1] wherein at least one of the first and second ranges is wider than T_p [in] [abstract; col.2, ll.4-47; wider than input T_p to exceed initially].

25. It would have been obvious to one of ordinary skill in the art, having the teachings of Christiansen, Hondegheem and Hayne before him at the time the invention was made, to modify the apparatus taught by Christiansen and Hondegheem to include the teachings of Hayne, in order to obtain the claimed apparatus. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to control fluctuations caused by temperature changes in the delay elements [Hayne: col.2, ll.1-55].

Allowable Subject Matter

26. Claims 17-19 are allowed.

27. Claims 9-10, 12-14, 28-29, 31-33, 36-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tse Chen whose telephone number is (571) 272-3672. The examiner can normally be reached on Monday - Friday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Browne can be reached on (571) 272-3670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tse Chen
June 9, 2006


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